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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO. <i>pk</i>
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EXAMINER

ART UNIT	PAPER NUMBER
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DATE MAILED: *7*

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/397,814

Applicant(s)

Zhong-Cheng Hu

Examiner

Daniel S. Metzmaier

Group Art Unit

1712



☒ Responsive to communication(s) filed on Aug 28, 2000

☐ This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-59 is/are pending in the application.

Of the above, claim(s) 52-59 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-51 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 1712

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of the restriction and election in Paper No. 5 is acknowledged. The traversal is on the ground(s) that the lower alcohols should be examined together as set forth in claim 8 among others. The lower alcohols will be examined in the aqueous system employing a zirconium salt.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed. See Form PTO-948.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 11, 12 and 22-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11 and 12 set forth a ratio of organic solvent to water but fail to define the units of said ratio, eg., wt/wt, vol/wt or vol/vol.

Art Unit: 1712

Claims 22-33 are indefinite because it is unclear whether the particles referred to as having a diameter of 10 nm to 100 nm are dry particles, sol particles or gel particles.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 7-20, 22-23, 25-35, 37-44, and 46-51 are rejected under 35 U.S.C. 102(b) as being anticipated by M. Z.C. Hu et al., "Nucleation and growth for Synthesis of Nanometric Zirconia particles by Forced Hydrolysis", J. of Colloid and Interface Science, 198:87-99 (1998)¹. M. Z.C. Hu et al (page 88, Materials and Method et seq) discloses methods of making nanoparticles by mixed solvent nucleation and growth of zirconia particles.

7. Claims 1-5, 7-21, and 34-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Y. T. Moon et al., "Preparation of Monodispersed and spherical Zirconia Powders by Heating of Alcohol-Aqueous Salt Solutions", J. Am. Ceram. Soc., 78(10): 2690-2694 (1995). Y.T. Moon discloses methods of making monodispersed ZrO₂ from zirconyl chloride solutions.

¹M.Z.C. Hu et al was published in February 1998 in vol. 198, No. 1 of J. of Colloid and Interface Science and therefore qualifies as prior art under 35 USC 102(b)

Art Unit: 1712

Moon (page 1103) discloses 0.2M salt solution, R/H (alc/water vol. Ratio) ranges from 2 to 5. Figures 2 and 3 clearly show temperatures within applicants range of claims 13 and 14. Moon (micrographs, Fig 4-6) show nanosized particles.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Y. T. Moon et al., "Preparation of Monodispersed and spherical Zirconia Powders by Heating of Alcohol-Aqueous Salt Solutions", J. Am. Ceram. Soc., 78(10): 2690-2694 (1995).

Y.T. Moon discloses methods as set forth in the above anticipation rejection.

Moon differs from claim 6 in the point of addition of the dispersant.

Moon (page 2693) discloses the dispersant is absorbed on the particles during particle growth. It is concluded the dispersant is added prior to or during incubation and would be absorbed at any time prior to the conclusion of particle growth which would inhibit or stop particle growth and therefore incubation.

It would have been obvious to one of ordinary skilled in the art at the time of applicants invention to add the dispersant after the conclusion of the incubation since it inhibits of agglomeration and further growth of particles.

Art Unit: 1712

Moon differs from claims 22-33 in the particle size of the material produced. Moon teaches the particle growth is controlled by the dielectric properties via temperature, solvent volume ratio and would be expected to be advantageous for the increased surface area associated with smaller particle size. Merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. **In re Aller**, 220 F.2d 454, 105 U.S.P.Q. 233 (C.C.P.A. 1955).

The remaining claims are included in this rejection to the extent the variation of all parameters claimed in a single method of making particles has not been explicitly disclosed in one process said variation is within the level of one having ordinary skill in the art as a point of law

In re Aller, *supra*.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Metzmaier whose telephone number is (703) 308-0451. The examiner can normally be reached on Monday through Friday from nine to five-thirty.

Art Unit: 1712

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson, can be reached at (703)308-2340.

Official Papers may be submitted to **Group 1700** by facsimile transmission at (703)872-9310 and Official After Final facsimile transmissions may be submitted to **Group 1700** by facsimile transmission at (703)872-9311 in accordance with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 1700** receptionist whose telephone number is (703) 308-0661.

DSM
November 6, 2000



Daniel S. Metzmaier
Patent Examiner
Art Unit 1712